BERCHTOLD®

CHROMOPHARE®

D 650*plus*, D 530*plus*, D 300, C 95x

Operating instructions

Single Light and Combination Light

Berchtold. Wir helfen

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1. GENERAL

1.1 Introduction

The CHROMOPHARE® D 650plus, D 530plus and C 95x, consists of a swivel arm support, a lamp housing and a flange tube .The lamp housing is fixed to a cardanic-type support (vertical gimbal joint, horizontal gimbal joint) and can be rotated, swiveled and tilted in any direction. The height is adjusted via the 360° rotating vertical spring arm. The spatial position of the lamp is adjusted by means of the 360° rotating horizontal swivel arm.

The special features of the CHROMOPHARE® D generation are:

- Dents and paint scratches or chips on the light hood are eliminated. An impact-absorbent light hood made of polymer material prevents deformations and paint defects.
- Cool light in the surgical area and in the beam path of the operating lights, which is achieved by filtering out the infrared proportion by means of the proven ThermoSorb® double filter system.
- The newly designed suspension and the hand grip with a particularly wide protective collar and an integrated release mechanism, ensure a high degree of hygiene.
- In the case of failure of the main lamp, 100 percent identical light ratios are guaranteed by the lamp-swivel mechanism, which swings the reserve lamp into the position of the main lamp.

Additional special features of the CHROMOPHARE® D 650plus

- High illuminance of 130.000 lx for illuminating a deep surgical area, which is achieved with the assistance of the newly developed polygon reflector with its mirror-like surface and “light booster”.
- Increase of the illuminance till to 150.000 lx with the assistance of the booster function.
- Excellent depth of illumination and low shadow levels, which are achieved by modifying the light beam using reflector elements.

Additional special features of the CHROMOPHARE® D 530plus

- High illuminance of 110.000 lx for illuminating a deep surgical area, which is achieved with the assistance of the newly developed polygon reflector with its mirror-like surface.
- Excellent depth of illumination and low shadow levels, which are achieved by modifying the light beam using reflector elements.

Additional special features of the CHROMOPHARE® C 950 and C 952 are:

- Cool light in the surgical area and in the beam path of the operating lights, which is achieved by filtering out the infrared proportion by means of the proven ThermoSorb® double filter system.
- The suspension and the hand grip ensure a high degree of hygiene.
- High illuminance of the CHROMOPHARE® C 950G till to 105.000 lx for illuminating a deep surgical area, which is achieved with the assistance of the newly developed polygon reflector with its mirror-like surface.
- High illuminance of the CHROMOPHARE® C 952G till to 150.000 lx for illuminating a deep surgical area, which is achieved with the assistance of the newly developed polygon reflector with its mirror-like surface. Increased intensity via clear light emission surface
- Excellent depth of illumination and low shadow levels, which are achieved by modifying the light beam using reflector elements.

1.2 Manufacturer´s notes

The manufacturer of the products specified in the user's manual is:

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Ludwigstaler Straße 25
Postfach 4052
D-78505 Tuttlingen
Internet: www.BERCHTOLD.de
e-mail: Info@BERCHTOLD.de
Tel. (+49) 7461 / 181-0
Fax (+49) 7461 / 181-200

1.3 General information

- This user's manual is considered part of the equipment. It must be kept in the vicinity of the equipment at all times. Precise observance of the user's manual is a prerequisite for the proper use and correct operation of the equipment, which is essential for the safety of patients and operators alike.

- Only accessories which are specified in this user's manual, and which have been tested together with the equipment, may be used. If accessories are used which are not specified in the user's manual, their ability to be used in accordance with safety regulations must be proved.

- All literature relates to the equipment model and the prevailing basic safety regulations when printed. All rights are reserved for equipment, switches, procedures, software programs and names.

1.4 Information about product liability

BERCHTOLD considers itself responsible for the consequences of safety, reliability and performance of the equipment only if

a) installation, modifications or repairs have been performed only by BERCHTOLD, or by an agent expressly authorized by BERCHTOLD to do so,

b) the electrical installation of the room complies with regulations IEC 60364-7-10,

c) the equipment is used in accordance with the user's manual.

1.5 Receiving inspection

Please inspect the equipment and accessories immediately after receipt for any transportation damage and defects.

Claims for damage will only be valid if the vendor (BERCHTOLD) or the carrier are informed at once. A damage report must then be prepared immediately. The damage record must be submitted to the nearest BERCHTOLD representative or to BERCHTOLD directly.

When an appliance or parts of an appliance are returned to BERCHTOLD or to a BERCHTOLD service agent, the original packaging should be used where possible. The following accompanying documentation must be attached: owner's name and address, equipment number (see type plate), description of the defect.

1.5.1
For transport and storage (in original packing, ; for maximum 15 weeks)
Ambient temperature - between –10°C and +60°C
Relative air moisture - between 10 % and 85 %, no condensation
Air pressure - between 500 hPa and 1060 hPa
For operation
Ambient temperature - between +10°C and +40°C
Relative air moisture - between 30 % and 75 %
Air pressure - between 700 hPa and 1060 hPa

1.6 EC Certification

The equipment complies with the requirements of the EC guideline regarding medical products, 93/42/EEC as well as the UL guidlines.

2. BEFORE OPERATING

2.1 Range of application (purpose)

The CHROMOPHARE® light is a medical light for use in hospital treatment rooms. It is used for the local illumination of the patient's body, so that illnesses, injuries and handicaps can be recognized and treated. It may only be used in rooms which have been correctly designed out in accordance with IEC 60364-7-10.

The CHROMOPHARE® light as a single light provides a very high degree of failure protection, as it is equipped with automatic switch-over to a reserve lamp, electronic monitoring with a "bypass switch" and an automatic APU switch-over. However, not all components are duplicated, so that in some circumstances a failure is still possible. As a matter of principle, single lights should not be used for operations where a light failure could represent a great danger to the patient.

Light combinations with two or even three light heads provide more security against light failure and a better brightness of the operating field. They provide light from different angles and maximum protection against light failure due to the fact that all components exist twice. This applies particularly when they are connected to an emergency power supply (APU) in addition to the mains supply. These combination lights may be used in all medical disciplines for the illumination of surgical areas.

2.2 Safety informations / cautions

- Incorrect operation and non-observance of safety measures can cause serious incidents. Therefore make sure that you have read and understood the information in your CHROMOPHARE® user's manual.
- The light is not intended for operation in areas where there is danger of explosion.
- Do not look into the switched-on light from the front and do not put any reflective objects into the path of the beam. Because of the high illumination strength there is a danger of glare.
- The distance between the light emission surface area of the operating light and the patient surface should not be less than 60 cm in order to ensure proper illumination.
- The light must not be operated if the cover glass or the filter system is damaged or destroyed. Thermal radiation can reach the surgical area, heating up and drying out the tissue of the operation wound. If the effect is prolonged, there is even the danger of tissue necrosis.
- Do not place any objects on the lamp housing or hang objects on arms or lamp housings, as this may compromise the stability of the fixing and there is the danger that these objects may fall into the surgical area. Attaching or hanging heavy objects can destroy the mechanism.
- The lamp housing must not be covered while in operation, as this prevents heat exchange with the environment and could cause the surgical light to overheat.
- Collision of the supporting arms and lamp housings should to be avoided. A severe collision could result in lights being damaged or parts knocked off and falling into the surgical area.
- The overlay of the light fields can cause an increase in heat generation

2.3 Installation instructions

Mounting and installation of the CHROMOPHARE® lights must be in accordance with BERCHTOLD's "Mounting instructions for ceiling lights" and must only be performed by BERCHTOLD employees or by installation companies authorized by BERCHTOLD. The installation of lights on the ceiling of the operating room must be performed in accordance with BERCHTOLD's "Ceiling anchor plate and spacer block" mounting instructions due to weight and high torque.

Incorrect assembly of the lights can result in ceiling anchorage damage off and falling down, critically injuring the patient and operating staff in the process. The on-site electric installation must be performed in accordance with IEC 60364-710 and include a fuse protection as well as a mains switch for a simultaneous all-polo separation of the light. For further information, please note the mounting instructions.

2.4 Instructions for initial start-up

The operator may begin to use the light, after the manufacturer or supplier:

a) Has carried out a performance check at the place of operation,

b) has introduced those responsible for the operation of the light to its correct handling by means of the user's manual.

2.5 Visual and performance check

Before initial start-up the manufacturer or supplier should check that the CHROMOPHARE® light has been properly installed and is in a safe and operational condition.

A visual inspection of the following points must take place:

- After switching-on the unit, light must be emitted from the main lamp, and in the case of combination lights, also from the additional lamp.

- Inspection of the light emission lens of the lamp housing.
  If the light emission lens is damaged or broken, glass splinters can fall out. The light must be switched off immediately and must not be used until the defect has been rectified.

- Inspection of the reserve lamp warning indicator CHROMOPHARE® C 95x
  In the case of failure of the main lamp, the reserve lamp is automatically switched on: The red warning indicator on the keyboard illuminates to indicate this error. The defective main lamp must be replaced immediately.

- Inspection of the reserve lamp warning indicator CHROMOPHARE® D Generation
  In the case of failure of the main lamp, the reserve lamp is automatically switched on and swung into the position of the main lamp. The yellow warning indicator on the lamp housing illuminates to indicate this error. The defective main lamp must be replaced immediately.

- Checking the operational state of the control unit.
  The individual functions must be checked by activating the appropriate keys. Faults in the main circuit of the control electronics of the CHROMOPHARE® D 650 and D 530 are indicated by the red fault indicator on the control unit. In this case the light operates at its maximum luminous intensity and can no longer be controlled via the keys.

- Checking the movement mechanism for perfect operation.
  The mechanical operation of the lightsystem is checked by swiveling and rotating the movement mechanism.

2.6 Cleaning, sterilization, disinfection

- All parts of the CHROMOPHARE® light can be cleaned with standard commercial cleaners on all exterior surfaces including the control unit, and disinfected with the disinfectants normally used in surqical areas.

- Only disinfectants may be used, which are certified from the manufacturer at the following materials: Polycarbonat (PC), Poliamid (PA), Polyvenylclorid (PVC), Acrylnitril-Butadien-Styrol-Copolymer (ABS), Polyetherimid (PEI) and on Silicons.

- Cleaning, disinfectant and sterilization of the sterilizable handles.
  The sterilizable handles are made of heat-proof, impact-resistant plastic (PEI). They can be cleaned with mild alkaline cleaners without active chlorine. The cleaners must be thoroughly rinsed off with water. Alternatively, the hand-grip holders can be cleaned mechanically with heat-sterilisation up to a maximum temperature of 93°C / 10 min.

  For disinfecting the handle sleeves we recommend products with an alcohol or aldehyde base. The sleeves must be rinsed before sterilization.

  The handles can be sterilized in steam. The recommended parameters are:
  1. Steam sterilization at 121° C; 1.3 bar; 25 to 30 minutes
  2. Steam sterilization at 134° C; 2.3 bar; 4 minutes

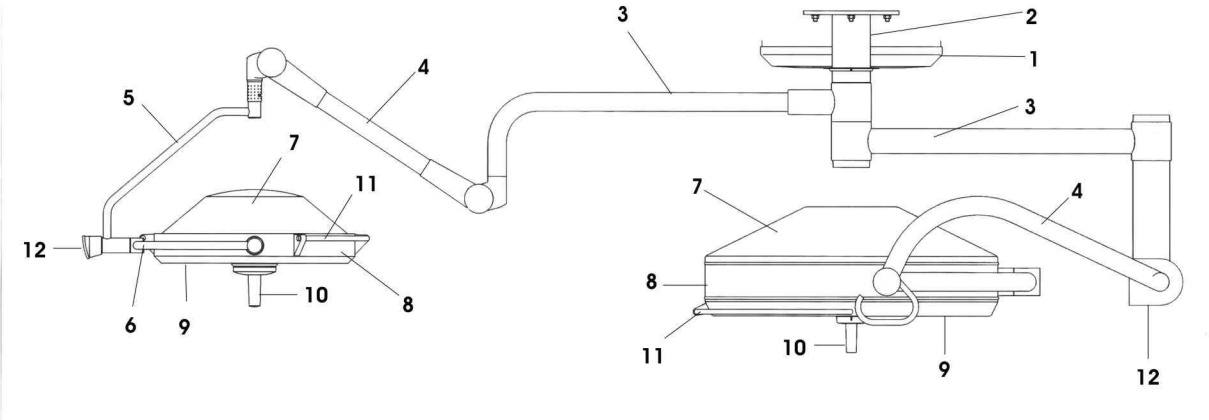
  When filling the autoclave ensure that the open side of the handles are face down. The sleeves must lie free and must not come into contact with any other items being sterilized.

  Hot-air sterilization is not recommended by BERCHTOLD. However, if it is necessary, the handles should be sterilized loose at 134° C; 3 minutes.

- ***Note:***
  Sterilizable handles are subject to natural wear. As a rule, a life of approx. 100 cleaning cycles is normal.
  Damaged grip sleeves must not continue to be used.
  The operator has to pay attention of the national Gremium for hygiene and desinfektion.

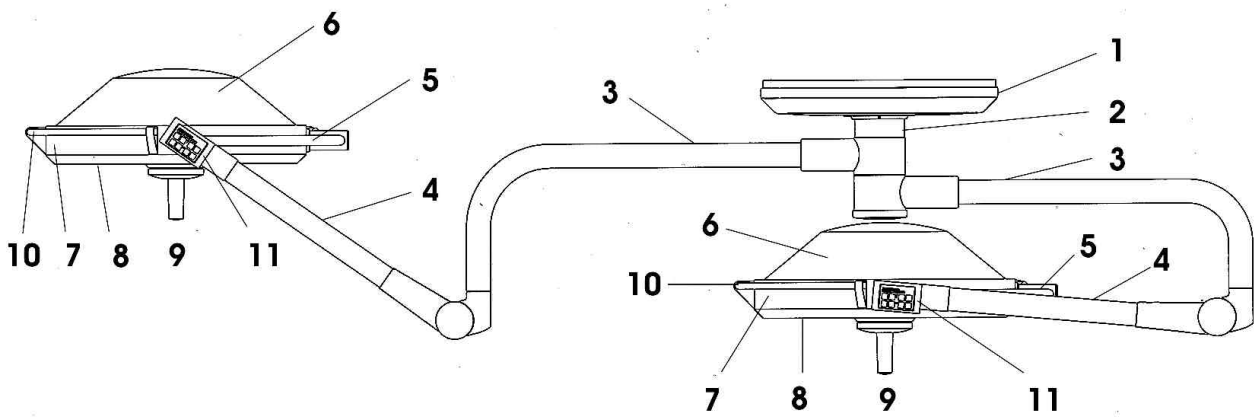
3. COMPONENTS

3.1 CHROMOPHARE® C 95x/D 650plus or C 95x/D 530plus



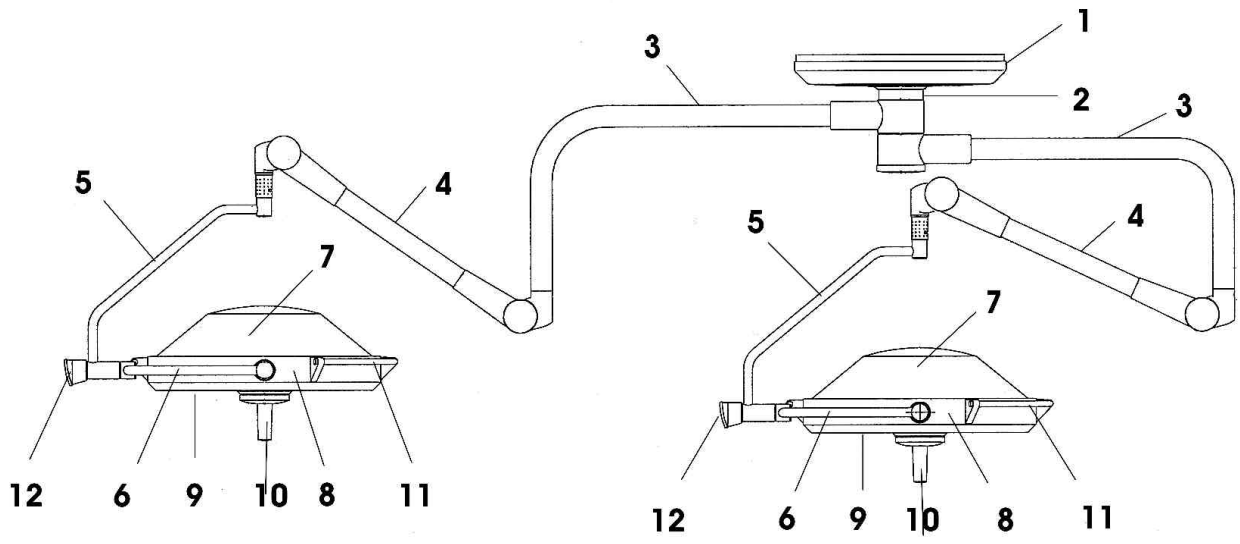
1	Ceiling cover	7	Lamp housing hood
2	Flange tube ∅125 mm	8	Lamp frame
3	Horizontal swivel arm	9	Light emission lens
4	Vertical spring arm	10	Sterilizable handle
5	Vertical gimbal joint	11	Rail (encircling hand grip)
6	Horizontal gimbal joint	12	Control panel

3.2 CHROMOPHARE® D 650plus / 650plus or D 530plus (flat cardanic)



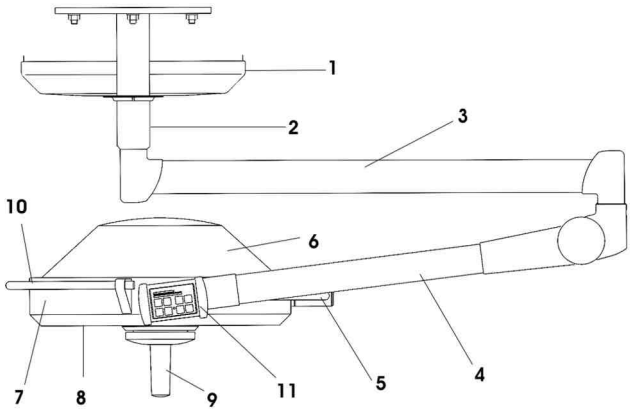
1 Ceiling cover
2 Flange tube ∅125 mm
3 Horizontal swivel arm
4 Vertical spring arm
5 Cardan joint
6 Lamp housing hood
7 Lamp frame
8 Light emission lens
9 Sterilizable handle
10 Rail (encircling hand grip)
11 Control panel

3.3 CHROMOPHARE® D 650plus / 650plus or D 530plus (classic cardanic)



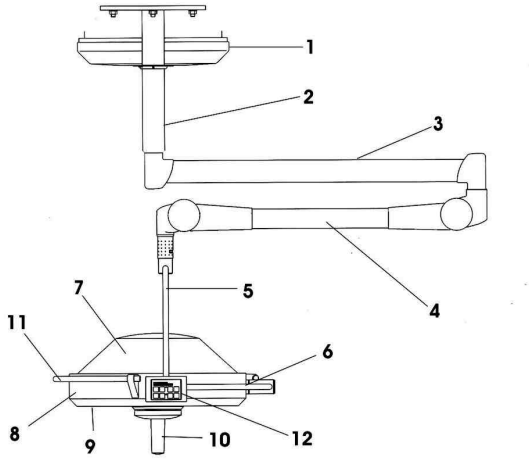
1 Ceiling cover
2 Flange tube ∅125 mm
3 Horizontal swivel arm
4 Vertical spring arm
5 Vertical gimbal joint
6 Horizontal gimbal joint
7 Lamp housing hood
8 Lamp frame
9 Light emission lens
10 Sterilizable handle
11 Rail (encircling hand grip)
12 Control panel

3.4 CHROMOPHARE® D 530plus (flat cardanic)



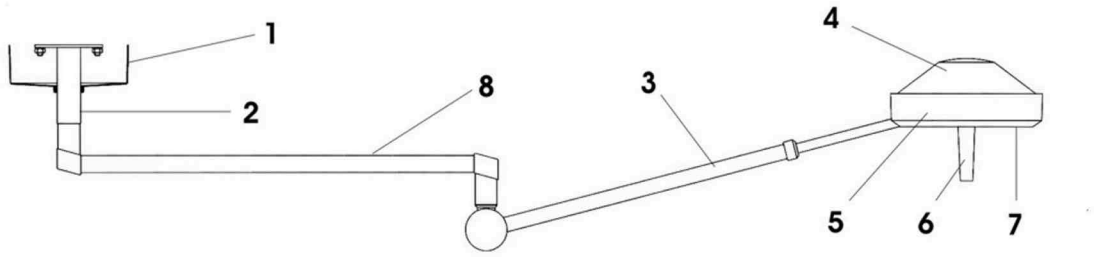
1 Ceiling cover
2 Flange tube 65 mm ø
3 Horizontal swivel arm
4 Vertical spring arm
5 Horizontal gimbal joint
6 Lamp housing hood
7 Lamp frame
8 Light emission lens
9 Sterilizable handle
10 Rail (encircling hand grip)
11 Control panel

3.5 CHROMOPHARE® D 530plus (classic cardanic)



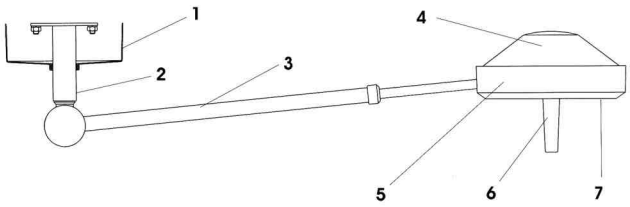
1 Ceiling cover
2 Flange tube 65 mm ø
3 Horizontal swivel arm
4 Vertical spring arm
5 Vertical gimbal joint
6 Horizontal gimbal joint
7 Lamp housing hood
8 Lamp frame
9 Light emission lens
10 Sterilizable handle
11 Rail (encircling hand grip)
12 Control panel

3.6 CHROMOPHARE® D 300 (double arm)



1 Ceiling cover
2 Flange tube
3 Vertical spring arm
4 Lamp housing hood
5 Lamp frame
6 Sterilizable handle
7 Light emission lens
8 Horizontal swivel arm

3.7 CHROMOPHARE® D 300 (single arm)

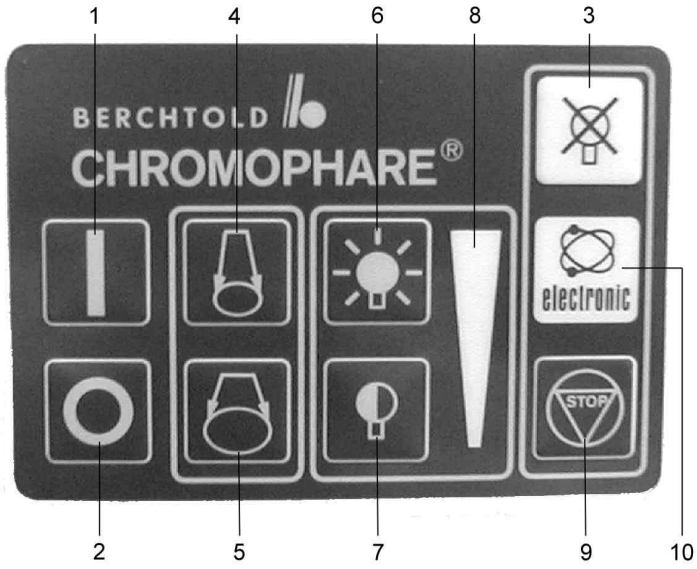


1 Ceiling cover
2 Flange tube
3 Vertical spring arm
4 Lamp housing hood
5 Lamp frame
6 Sterilizable handle
7 Light emission lens

4. OPERATION

4.1 Control Panel and symbols CHROMOPHARE® C 95x

The following functions can be controlled by the control panel:



1	ON	Switch on the light
2	OFF	Switch off the light
3	Red indicator	LED indicates main light is faulty
4	Field size smal	Reduce field size
5	Field size large	Enlarge field size
6	Bright	Increase intensity
7	Dark	Decreases intensity
8	Column indicator	Indicates the intensity of luminosity selected
9	<Stopp> key	Interrupts AB and LFN. By pressing the <On> key, AB and LFN are re-enabled
10	Red indicator	Warning signal indicating a breakdown in the control circuit When the <Stop> (9) key is pressed, the indicator will remain illuminated

(ON) The OP light is switched on by pressing **Key 1.**

(OFF) The OP light is switched off by pressing **Key 2.**

(Bright) By pressing and holding down **Key 6** the illuminance is continuously increased up to the maximum value. Repeated short presses increase the illuminance in steps.

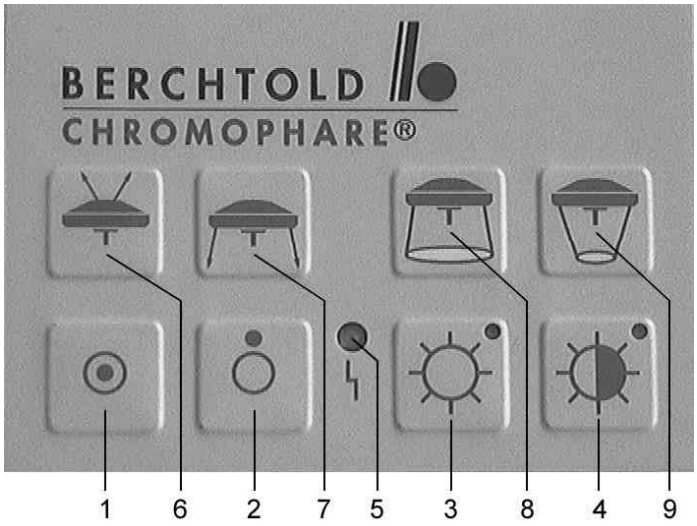
(Dark) By pressing and holding down **Key 7** the illuminance is continuously reduced down to the minimum value. Repeated short presses decrease the illuminance in steps.

(field size small) By pressing and holding down **Key 4** the light field is continuously reduced down to the minimum value. Repeated short presses reduce the light field in steps.

(field size large) By pressing and holding down **Key 5** the light field is continuously enlarged up to the maximum value. Repeated short presses enlarge the light field in steps.

4.2 Control Panel and symbols CHROMOPHARE® D 650plus

The following functions can be controlled by the control panel:



1	ON	Switch on the light
2	OFF	Switch off the light
3	Bright	Increase intensity (the reach of the maximum intensity will be displayed by a light emitting diode)
4	Dark	Decrease intensity (the reach of the minimum will be displayed by a light emitting diode)
5	Fault	LED indicates that the control unit has a fault
	Options:	
6	EndoLite®	Switch from surgical area light to surround light (option only)
7	OP light	Switch from surround light to surgical area light
8	Field size large	Enlarge field size (only with LFN option)
9	Field size smal	Reduce field size (only with LFN option)

(ON) The OP light is switched on by pressing **Key 1.**

(OFF) The OP light is switched off by pressing **Key 2.**

(Bright) By pressing and holding down **Key 3** the illuminance is continuously increased up to the maximum value. Repeated short presses increase the illuminance in steps.

(Dark) By pressing and holding down **Key 4** the illuminance is continuously reduced down to the minimum value. Repeated short presses decrease the illuminance in steps.

Fault If the indicator light shows **red**, there is a fault in the control unit electronics.

EndoLite® Only with the EndoLite® option. By pressing **Key 6** EndoLite® the surgical area illumination is switched off and the surround lighting is switched on.

(OP light) Only with the EndoLite® option. By pressing **Key 7** the EndoLite® surround lighting is switched off and the surgical area lighting is switched on again.

(field size large) Only with the LFN model. By pressing and holding down **Key 8** the light field is continuously enlarged up to the maximum value. Repeated short presses enlarge the light field in steps.

(field size small) Only with the LFN model. By pressing and holding down **Key 9** the light field is continuously reduced down to the minimum value. Repeated short presses reduce the light field in steps.

Booster activation

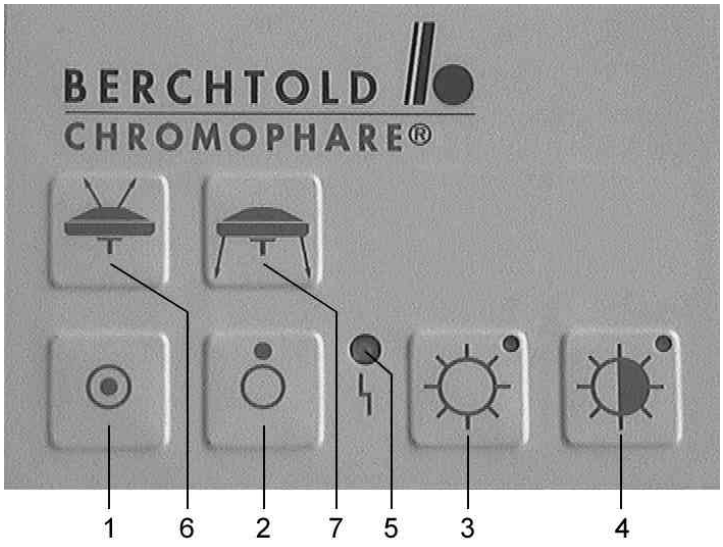
1. Press key 4 **(Bright)** until LED flashes up in the key (max. brightness).
2. The light booster will be activated by pressing simultaneously the key 1 **(ON)** and 3 **(Bright)**. Luminous power rises from 130 klx to 150 klx.

Note!

The light booster is deactivated by switching off the light with key 2 (OFF).

4.3 Control Panel and symbols CHROMOPHARE® D 530plus

The following functions can be controlled by the control panel



1	ON	Switch on the light
2	OFF	Switch off the light
3	Bright	Increase intensity (the reach of the maximum intensity will be displayed by a light emitting diode)
4	Dark	Decrease intensity (the reach of the minimum intensity will be displayed by a light emitting diode)
5	Fault	LED indicates that the control unit has a fault
	Options:	
6	EndoLite®	Switch from surgical area light to surround light (option only)
7	OP light	Switch from surround light to surgical area light

(ON) The OP light is switched on by pressing **Key 1.**

(OFF) The OP light is switched off by pressing **Key 2.**

(Bright) By pressing and holding down **Key 3** the illumination is continuously increased up to the maximum value. Repeated short presses increase the illumination in steps.

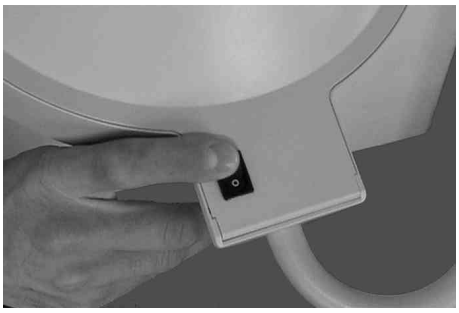
(Dark) By pressing and holding down **Key 4** the illumination is continuously reduced down to the minimum value. Repeated short presses decrease the illumination in steps.

(Fault) If the indicator light shows **red**, there is a fault in the control unit electronics.

EndoLite® Only with the EndoLite® option. By pressing **Key 6** the surgical area illumination is switched off and the surround lighting is switched on.

(OP light) Only with the EndoLite® option. By pressing **Key 7** the EndoLite® surround lighting is switched off and the surgical area lighting is switched on again.

4.4 CHROMOPHARE® D 300 double arm and single arm

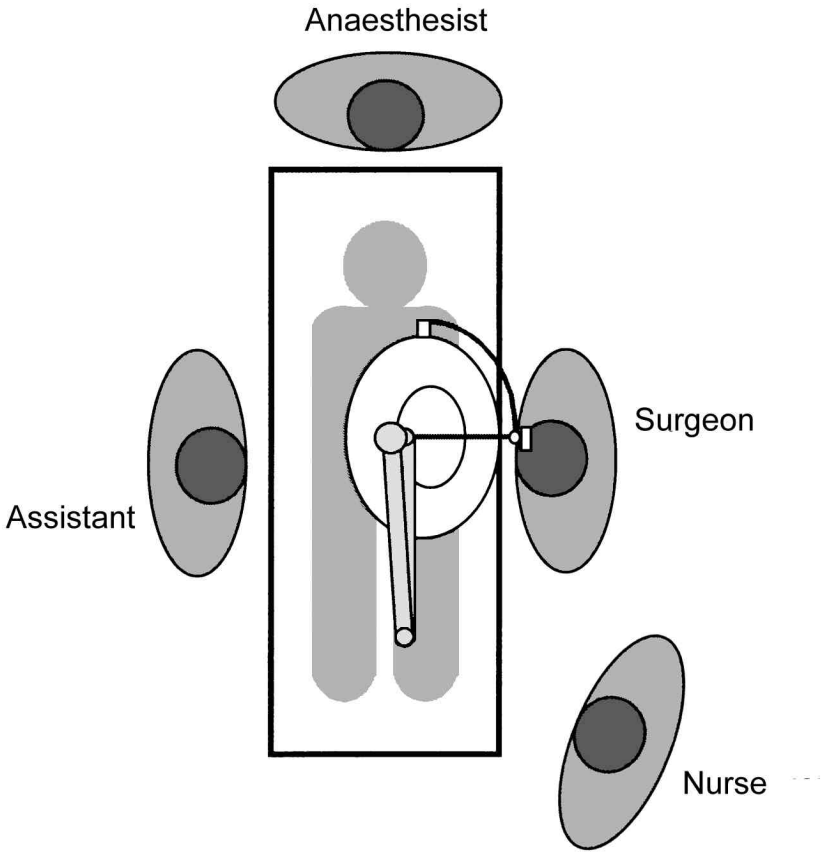


The **ON / OFF** switch is situated at the top of the light head..

Push the switch to switch the light on or off.

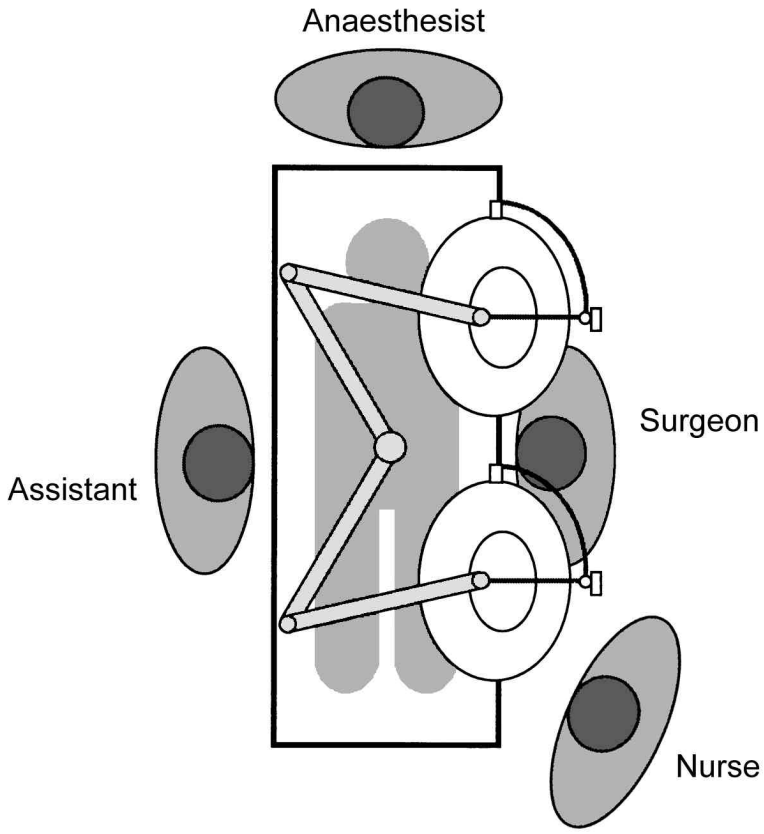
4.5 Notes on operation and Positioning the lights

Before an operation the lamp housing should be placed in an initial position, so that it can later be easily adjusted both horizontally and vertically. In the case of a single light, it is positioned over the center of the surgical area (see illustration 1). The distance from the lower edge of the light to the operating table is approx. 1.15 m. Initial positioning is accomplished by using the rail on the lamp housing. The surgeon has the option of adjusting the light using the center hand grip, which is provided with a replaceable sterilized sleeve. In the case of combination lights the main light is positioned over the center of the surgical area and the additional light over the foot area.



The light should be set in the basic position so that the position of the lamp housing may be changed easily without using force and the control unit can be reached easily by “non-sterile” personnel to adjust the brightness.

In the case of a combination light the lamp housings are positioned so that the light fields of both lights are coincident You have to consider the following: The light's adjustment to maximum illumination causes an increased desiccation of the tissue. Swivel and spring arms are positioned in the basic setting as shown in illustration 2. With this arrangement the position of the lamps can be easily changed without using force.



In the case of a combination light the basic setting is in accordance with illustration 2. In this arrangement both lamps can be easily moved, and the control units of both lamps can be easily reached by "non-sterile" personnel.

In operations in which it is necessary to intervene at two separate points as may be the case, for example, in a by-pass procedure, the two lamps are positioned above the two points of intervention as if they were single lights.

4.5.1 Adjusting the field size

4.5.2 CHROMOPHARE® C 95x on the control panel

By pressing and holding down Key 4 (field size small) the light field is continuously reduced down to the minimum value. Repeated short presses reduce the light field in steps.
By pressing and holding down Key 5 (field size large) the light field is continuously enlarged up to the maximum value. Repeated short presses enlarge the light field in steps.
The surgeon must perform the optimum field setting himself in accordance with the size of the operation opening. There is an optimum contrast when the field size is set approx. 2 - 3 cm larger than the operation opening, so that the edge of the sterile covering is also illuminated. Thus the adaptation of the surgeon's eyes in the whole field of vision is improved.

4.5.3 Adjusting the field size with the center hand grip CHROMOPHARE® D 650plus, D 530plus

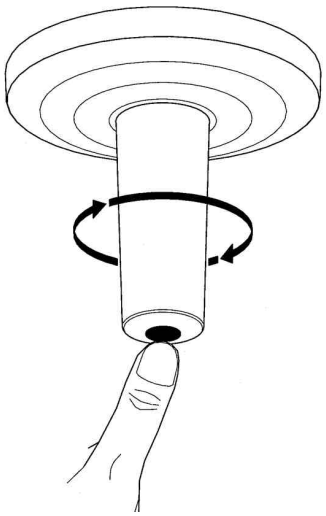
By turning the sterilizable center hand grip the size of the light field is changed. By turning the hand grip in the clockwise direction the light field is enlarged, by turning anti-clockwise the light field is reduced. The surgeon must perform the optimum field setting himself in accordance with the size of the operation opening. There is an optimum contrast when the field size is set approx. 2 - 3 cm larger than the operation opening, so that the edge of the sterile covering is also illuminated. Thus the adaptation of the surgeon's eyes in the whole field of vision is improved.

On CHROMOPHARE® D 650plus with the Light pilot option, the adaption of the field diameter is done at the control panel (please see chapter 4.2).

4.5.4 Changing the sterilizable handles

CHROMOPHARE® C-Generation

By pressing the release button the handle is released and can be removed from the sleeve mounting.
The new sterilized replacement sleeve is pushed onto the sleeve mounting until it touches the stop and is then turned in a clockwise direction until the sleeve locks into place.



CHROMOPHARE® D-Generation
By pressing the release button the handle is released and can be removed from the sleeve mounting.
The new sterilized replacement sleeve is pushed onto the sleeve mounting until it touches the stop and is then turned in a clockwise direction until the sleeve locks into place.

4.6 Accessoires for CHROMOPHARE® operating lights

4.6.1 Sterilizable handles

• Standard replacement sleeve (C 95x)	Order no.	CZ 498-02
• Standard replacement sleeve (D 530plus and D 650plus)	Order no.	CZ 499-06
• Replacement sleeve for LFN (C 95x and D 650plus)	Order no.	CZ 498-04
• Replacement sleeve for light system with ChromoVision® AFII & FZ	Order no.	CZ 498-08

Note!
To each CHROMOPHARE® light get to delivered two sterilizable handles.

For directions about cleaning, disinfection and sterilization, see chapter 2.6.

4.6.2 Halogen bulb (reserve halogen bulb)

CHROMOPHARE® C 95x, D 650plus, D 530plus, D 300

• Halogen bulb for C 95x	22,8 V / 250 W	Order no.	CZ 907-22
• Halogen bulb for D 650plus or D 530plus	22,8 V / 150 W	Order no.	CZ 908-22
• Halogen bulb for D 300	12;0 V / 50 W	Order no.	CZ 955-12

4.7 System variants

The CHROMOPHARE® C 95x, D 650plus, D 530plus and D 300 is available in the following system variants:

1. CHROMOPHARE® C 95x as a single light
2. CHROMOPHARE® C 95x as a combination light with D 650plus
3. CHROMOPHARE® C 95x as a combination light with D 530plus
4. CHROMOPHARE® D 650plus as a single light
5. CHROMOPHARE® D 650plus as a double and a triple light
6. CHROMOPHARE® D 650plus as a combination light with D 530plus
7. CHROMOPHARE® D 530plus as a single light
8. CHROMOPHARE® D 530plus as a double and a triple light
9. CHROMOPHARE® D 300 as a single arm
10. CHROMOPHARE® D 300 as a double arm

5. OPTIONS

5.1 Options for CHROMOPHARE® C 95x

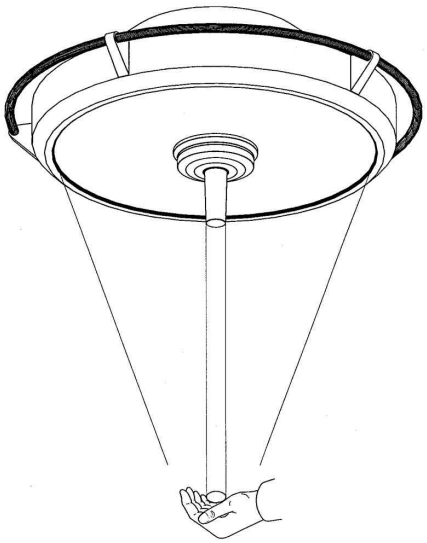
- Light carrier arm for up to 15 kg load with AC and PA connections for an auxiliary device for example (Only possible if the light has been prepared for an aditional arm in advance).
- Light carrier arm for up to 15 kg load with AC and SVHS connections for a LCD Monitor.
- Supply carrier arm for up to 25 kg load with AC and PA connections, prepared for gas supply. This option must be ordered with the lighting system (not upgradable).

5.2 Options for CHROMOPHARE® D generation

- Light carrier arm for up to 15 kg load with AC and PA connections for an auxiliary device for example. (Only possible if the light has been prepared for an aditional arm in advance)
- Light carrier arm for up to 15 kg load with AC and SVHS connections for a LCD Monitor.
- Supply carrier arm for up to 25 kg load with AC and PA connections, prepared for gas supply. This option must be ordered with the lighting system (not upgradable).
- Wall control unit for installation into a wall indicator panel. Functions such as switching on/off and brightness of the OP light can then be controlled from the wall. (not upgradable).

5.3 Light Pilot System (LFN) for CHROMOPHARE® C 95x

The CHROMOPHARE® C 95x can be ordered with an LFN Systemas an option (not upgradable). The LFN System is an electronic control system, which moves the lamps by electric motor. An infrared beam which is reflected by a reflector disk controls the LFN System.



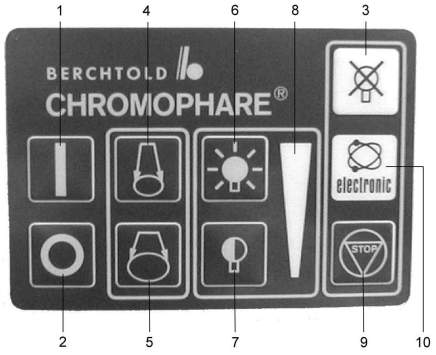
The operator can direct the light field to the position which guarantees optimum illumination of the surgical area, by means of a reflector disk, the so-called „Light Pilot“.

The „Light Pilot“ should be held in the center of the light field as far as possible and then slowly moved to the desired position. If movement is too quick, the light field will not be able to follow the „Light Pilot“.

This rule is: Wherever the light field is , the „Light Pilot“ will be hit by the infrared beam and can reflect the beam back.

Note:
The lamps, fitted with the system for following the field of light, are also automatically provided by the Autobloc System described at chapter 5.4

5.3.1 Adjusting the field size for LFN model CHROMOPHARE® C 95x



The CHROMOPHARE® C 95x with LFN allows the field size to be adjusted by an electric motor.
By pressing and holding down Key 4 (field size small) the light field is continuously reduced down to the minimum value. Repeated short presses reduce the light field in steps.
By pressing and holding down Key 5 (field size large) the light field is continuously enlarged up to the maximum value. Repeated short presses enlarge the light field in steps.

5.4 Autobloc System (AB) only CHROMOPHARE® C 95x

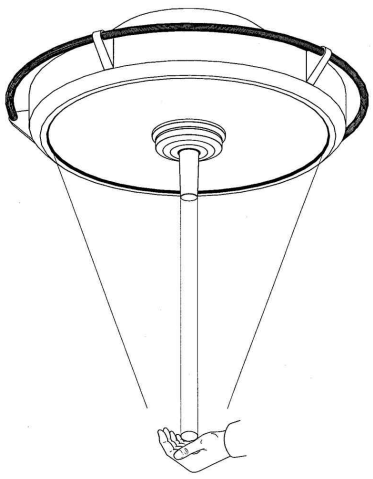
The CHROMOPHARE® C 95x models can be ordered with the self-lock option. This device cannot be installed as an upgrade in a piece of equipment purchased earlier and must be therefore ordered together with the lamp. The self-lock system is an electromagnetic, sensor-guided braking device, which locks the hinge-joints. Precise and easy positioning is not always possible in many of the larger lamps as they are constantly 'braked', however the self-lock system overcomes this problem.

Thanks to the electronic sensor guide the lamp becomes as light as a feather but remains locked in a particular position in the event it is touched accidentally.

By touching the handle (in the centre of the lamp) or the external rim, the electromagnetic brakes are released, thereby allowing the lamp to be positioned as required. When the hand grip is released, the brakes automatically lock again with the lamp fixed in a new position.

5.5 Light Pilot System LFN only for CHROMOPHARE® D 650plus

The CHROMOPHARE® D 650plus can be ordered with an LFN System as an option. The LFN System is an electronic control system, which moves the lamps by electric motor. An infrared beam which is reflected by a reflector disk controls the LFN System.



The operator can direct the light field to the position which guarantees optimum illumination of the surgical area, by means of a reflector disk, the so-called „Light Pilot".

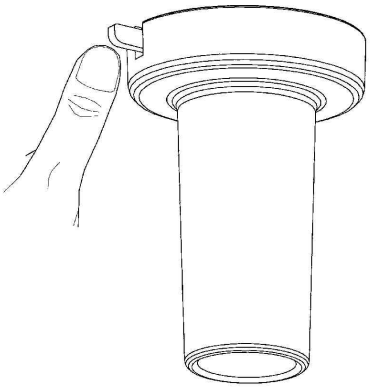
The „Light Pilot" should be held in the center of the light field as far as possible and then slowly moved to the desired position. If movement is too quick, the light field will not be able to follow the „Light Pilot".

This rule is: Wherever the light field is , the „Light Pilot" will be hit by the infrared beam and can reflect the beam back.

5.5.1 Adjusting the field size for LFN model CHROMOPHARE® D 650plus

The CHROMOPHARE® D 650plus with LFN allows the field size to be adjusted by an electric motor. By pressing and holding down Key 8 the light field is continuously enlarged up to the maximum value. By repeated short presses the light field is enlarged in steps. By pressing and holding down Key 9 the light field is continuously reduced down to the minimum value. By repeated short presses the light field is reduced in steps.

5.6 Changing the sterilizable handles - LFN model



The sterilizable hand grip sleeve is released by pressure on the bolt on the upper collar of the sleeve. It can then be removed from the sleeve mounting. The new sterilized replacement sleeve is pushed onto the sleeve mounting until it touches the stop and is then turned in a clockwise direction until the sleeve is heard locking into place.

5.7 Accessoires for CHROMOPHARE® C 950 and D 650plus LFN model – light pilot -

• Light Pilot for single LFN (resp. 10 pieces) Order no. CZ 498-10

• Light Pilot for double LFN (resp. 10 pieces) Order no. CZ 498-20

Note!
The „Light Pilot“ can be cleaned and disinfected with normal detergents and disinfectants or gas-sterilized to a maximum temperature of 70°. „The Light Pilot“ must not be sterilized with steam or hot air. This device is designed for approximately 10 sterilization-cycles and is supplied non-sterilized.

5.8 EndoLite®

The CHROMOPHARE® C 650plus and D 530plus model can be ordered with an optional environment illumination function (EndoLite®) for endoscopic operations. Room illumination with greatly reduced intensity is often installed for endoscopic operations so as not cause a disturbance to surgeons or operators and to facilitate observation of the monitors.
It is also possible to install the EndoLite® option at a later date in the CHROMOPHARE® C 650plus and D 530plus lamp. Operating room illumination is obtained by means of a 20 W halogen lamp incorporated in the lamp body housing and directs light upwards.

By pressing Key 6 (OP light) the EndoLite® surround lighting is switched off and the surgical area lighting is switched on again.
By pressing and holding down Key 7 (field size large) the light field is continuously enlarged up to the maximum value. Repeated short presses enlarge the light field in steps..

Reserve bulb 12 V / 20 W Order no. CZ 960-12

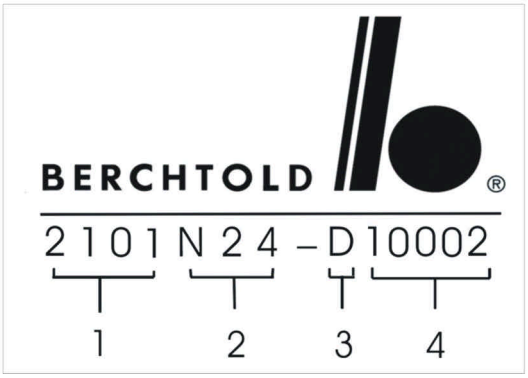
5.9 Camera-system

The CHROMOPHARE® D 650plus and D 530plus model can be ordered with an optional integrated BERCHTOLD ChromoVision® AFII camera system (PAL or NTSC). If you use the camera system please note that you cannot use the option LFN. You can order our CHROMOPHARE D 530plus either with a BERCHTOLD camera system ChromoVision AF II or ChromoVision FZ (Pal or NTSC). Note that the camera system can be installed in a standard model at a later date provided that the lamp already being used is designed for installation of the camera system.
The BERCHTOLD ChromoVision® AFII camera system allows the user to record the various phases of an operation for didactic and documentary purposes. In the BERCHTOLD ChromoVision® AFII system a camera is fitted in the central hand grip of the lamp, which can be worked by means of an external control.

It is possible to obtain live viewing of an operation with a monitor or record an operation with video-recording equipment.
The use and characteristics of the lamp are, generally speaking, unvaried whenever a camera is used. The light field width cannot be adjusted however when the television function is used. Use and installation of the camera system are illustrated separately in the "Operating Instructions" of the ChromoVision® AFII model.

6. MAINTENANCE

6.1 Serial no. Identification



Type plate (A)

1 Version number
2 Variant
3 Manufacturing year
4 Serial number

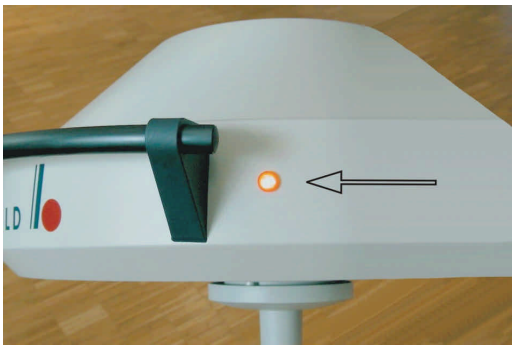
The CHROMOPHARE® lights should be serviced once a year (maintenance contract). Maintenance may only be carried out by BERCHTOLD or by a company authorized by BERCHTOLD (see notes on product liability). Before performing any ordinary maintenance the lamp must be connected to the wall switch socket and switched off.

6.2 Notes on changing fuse

In this lamp the mains fuses and the fuses for the emergency power supply are not located in the flange under the cover but are located externally, in the switchboard and electric control panel respectively, so as to allow for easy replacement in the case of an illumination failure (except D 300 12V).

The value of fuse are withdraw from the CHROMOPHARE® mounting instruction for ceiling lights.

6.3 Instructions for changing lamps

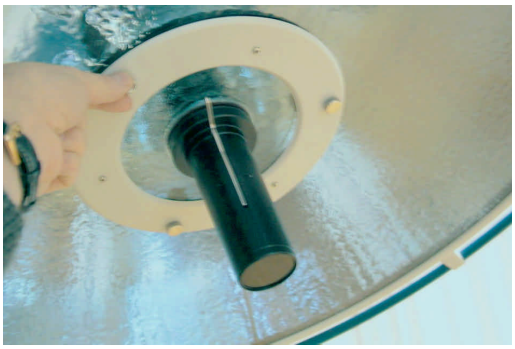


The halogen bulb has an average life of 1000 hours. In the event of failure of the main lamp, switch over to a reserve lamp occurs automatically and the reserve lamp swivels automatically into the former position of the main lamp.

A yellow indicator light up on the lamp housing D 650plus / D 530plus and a red indicator light up on the keyboard C 95x when the lamp safety system has switched over to the reserve lamp. The defective main lamp should then be exchanged as quickly as possible.

6.3.1 Instructions for the changing lamps CHROMOPHARE® C 95x

The symbol with the meaning 'Danger - Risk of Burning' is placed on the lamp support. Do not touch the quartz cone of the halogen bulb with your bare fingers, use a cloth or soft paper.



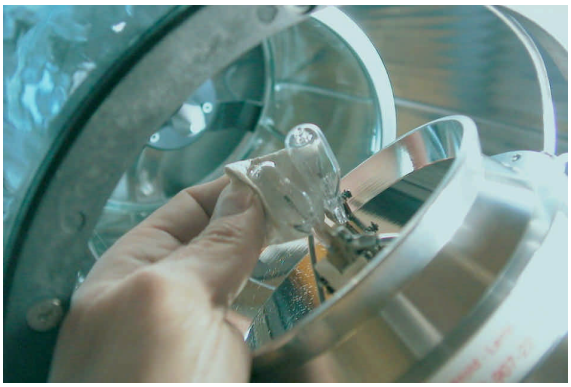
Switch off the lighting system and let it cool down (risk of burning).

Release and remove sterilizable handle.

Unscrew the knurled screw on the underside of the light by turning anti-clockwise.

Pull out the whole light system at the hand grip.

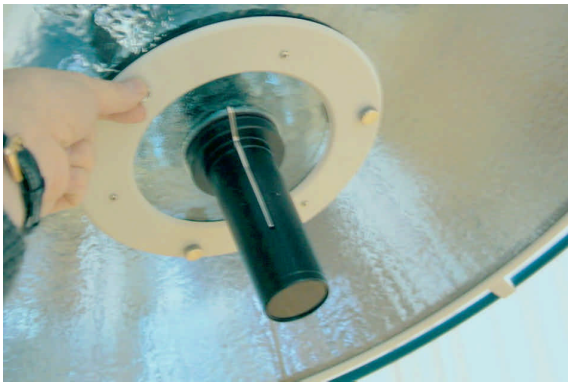
Open the fast-closing lock of the reflector (H) by turning towards the left. Turn the reflector (H) downwards.



Remove the faulty halogen lamp.
Note:
That the reserve lamp is recognized by the <R> marking on the base. We advise users to insert the reserve lamp in the main lamp holder and to insert the new halogen lamp in the reserve lamp holder.
Attention!
When a lamp is replaced, check to see whether there are over-heated parts in the lamp holders. If there are any over-heated parts, inform the client-assistance service.

Screw in the connector for the pull-out hand grip During this operation check the coding of components to ensure correct assembly. The plastic rings on the sides of the lamp and beside the hand grip unit can be connected in only one position.

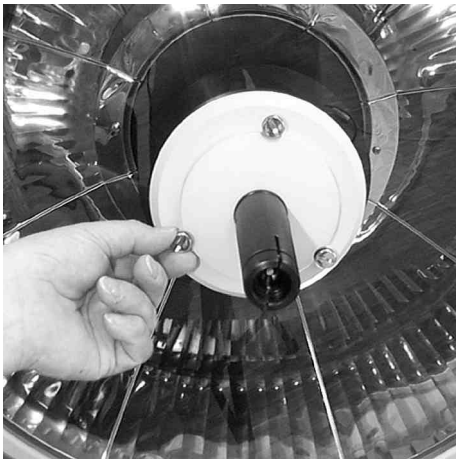
Switch on the illumination system and check whether the lamp lights up. Also make sure the warning lamp is off.



After replacing the faulty halogen lamp turn the reflector (H) upwards and close again by turning the fast-locking device towards the right.

6.3.2 Instructions for the changing lamps CHROMOPHARE® D 650plus, D 530plus

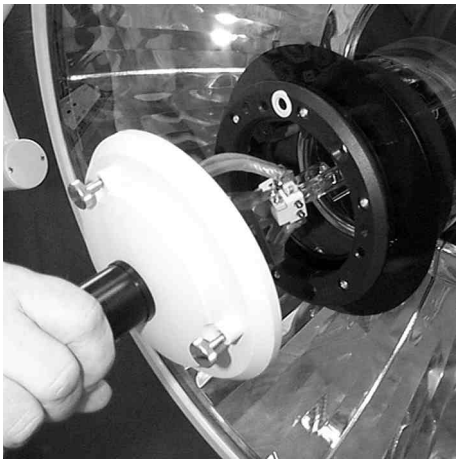
The symbol with the meaning 'Danger - Risk of Burning' is placed on the lamp support. Do not touch the quartz cone of the halogen bulb with your bare fingers, use a cloth or soft paper.



Switch off the lighting system and let it cool down (risk of burning). During replacement of the lamps the patient must not be touched as it is possible to come into contact with parts under tension.

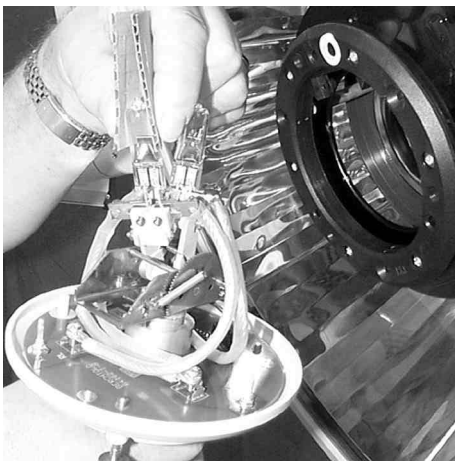
Release and remove sterilizable hand grip before.

Unscrew the knurled screw on the underside of the light by turning anti-clockwise.

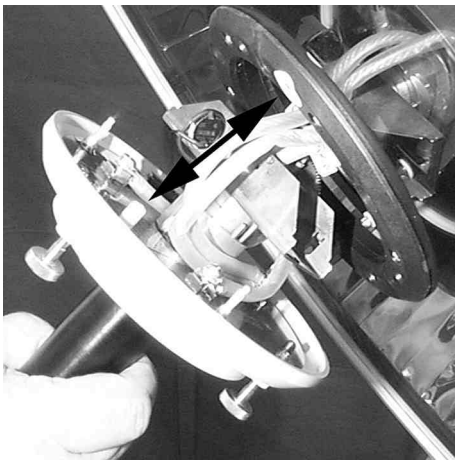


Pull out the whole light system at the hand grip (picture 2).

Remove a faulty halogen lamp. We advise users to insert the reserve lamp into the main light lamp holder , marked with <R>, and to insert the new halogen lamp in the reserve lamp holder so that the reserve lamp does not become too worn.



Fit a new halogen bulb into the bulb holder, - for the booking reference number see chapter 4.6.2 halogen bulb, (do not touch the quartz cone of the halogen bulb with your bare fingers, use a cloth or soft paper). During a lamp change check the bulb holder for scorch marks. If scorch marks are present, inform our service department.



Fit the light system back into the holder (picture 4) an screw up the knurled crews in a clockwise direction.

Switch the lighting system on and check that the lamp is on and the red indicator light is off.

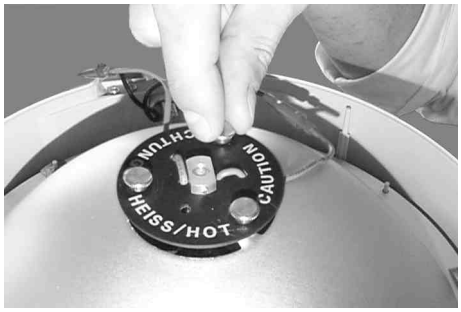
Note!
Only use original halogen bulbs. If other bulbs are used, all guarantees regarding performance and operation will lapse.

6.3.3 Instructions for the changing lamps CHROMOPHARE® D 300

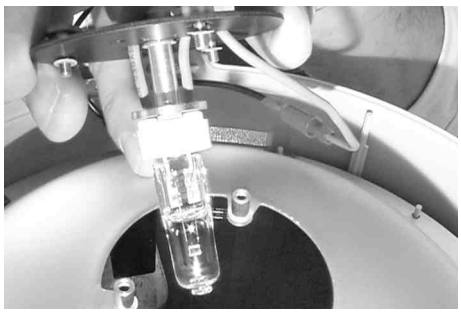
The symbol with the meaning 'Danger - Risk of Burning' is placed on the lamp support. Do not touch the quartz cone of the halogen bulb with your bare fingers, use a cloth or soft paper.

Switch off the light by means of the main switch at the light-head.

Open the lamp body by pressing the push-button to release the top-cover.



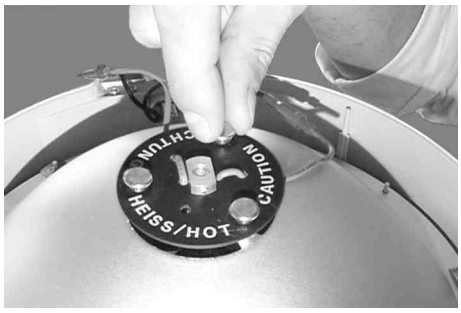
After having released the three knurled screws, the bulb holder cam be taken off the reflector.



Remove the defective halogen bulb and insert a new BERCHTOLD 12Volt (Order no.: CZ 955-12) into the holder.

Attention!

Do not touch the quartz cone of the halogen bulb with your bare fingers, use a cloth or soft paper.



Insert the bulb holder into the reflector and turn the screws clock-wise.

Switch on the light.

7. Technical data

7.1 CHROMOPHARE® C 950 G and C 952 G

	C 950 G		C 952 G	
Reflector system	Polygonreflektor			
Colour temperature	4500 K	3600 K	4500 K	3600 K
Intensity Ec at 1 m	105 [klx]	140 [klx]	150 [klx]	200 [klx]
Intensity control	45 – 105 [klx]	60 – 140 [klx]	64 – 150 [klx]	85 – 200 [klx]
Total radiant power at max intensity	391 W/m²	522 W/m²	560 W/m²	746 W/m²
Total radiant power/intensity Ec	3,7 [mW/m²lx]			
Colour rendering index R_a	94			
Light field diameter	20 - 35 cm			
d_{10} Light field dia. at 10% of max intensity	20 cm			
d_{50} Light field dia. at 50% of max intensity	12 cm			
Remaining illuminance when beam is obstructed by one mask	55 %		61 %	
Remaining illuminance when beam is obstructed by two mask	52 %		56 %	
Remaining illuminance inside at the bottom of a standardised tube.	88 %		86 %	
Remaining illuminance inside at the bottom of a standardised tube. Beam obstructed by one mask	43 %		47 %	
Remaining illuminance inside at the bottom of a standardised tube. Beam obstructed by two mask	46 %		44 %	
Depht of illumination L1 + L2	100 cm		110 cm	
Electrical data				
Prim. AC voltage of transforme	110 / 115 / 120 V AC 220 / 230 / 240 V AC			
Power consumption	450 VA oder 370 VA bei 28 V DC			
Transformer – rated capacity	450 VA / 50/60 Hz			
Safety Category	1			
Protection provided by enclosure	IP 53			
Ceneral data				
Halogen bulb Order no.	22,8 V / 250 W CZ 907-22			
Life time of halogen bulb	1000 h			
Autom. switch over to reserve bulb	yes			

Dimensions	
Diameter of light body	95 cm
Diameter of Polygon Reflectors	87 cm
Light emission surface (glass surface)	6380 cm^2
Max. swivel radius	193 cm
Lowest position of light body	110 cm
Highest position of light body	214 cm
Cleareance (single light)	200 cm at 270 cm finished ceiling
Weight / Torque	
Weight incl. transformer	121 kg
Max. torque	1072 Nm
Certificate	CE conform with 93/42 EEC UL listed

7.2 CHROMOPHARE® D 650plus

Light technical data	**D 650plus**	
Reflector system	Polygonreflector	
Colour temperature	4500 K	3600 K
Intensity Ec at 1 m	130 [klx]	150 [klx]
Intensity control	60 – 130 [klx]	70 – 150 [klx]
Total radiant power at max intensity	485 W/m²	555 W/m²
Total radiant power/intensity Ec	3,7 [mW/m²lx]	
Colour rendering index R_a	94	
Light field diameter	15 – 28 cm	15 – 28 cm
d_{10} Light field dia. at 10% of max intensity	15 cm	15 cm
d_{50} Light field dia. at 50% of max intensity	8 cm	8 cm
Remaining illuminance when beam is obstructed by one mask	47 %	47 %
Remaining illuminance when beam is obstructed by two mask	45 %	45 %
Remaining illuminance inside at the bottom of a standardised tube.	100 %	100 %
Remaining illuminance inside at the bottom of a standardised tube. Beam obstructed by one mask	47 %	47 %
Remaining illuminance inside at the bottom of a standardised tube. Beam obstructed by two mask	45 %	45 %
Depht of illumination L1 + L2	125 cm	125 cm
Electrical data		
Primary voltage of transformer	100 / 120 / 127 V A.C. 220 / 230 / 240 V A.C.	
Power consumption	240 VA or 170 AV at 24 V D.C.	
Rated capacity of transformer / frequency	240 VA / 50/60 Hz	
Safety Category	1	
Protection provided by enclosure	IP 53	
General data		
Halogen bulb Order no.	22,8 V / 150 W CZ 908-22	
Life time of halogen bulb	1000 h	
Automatic switch over to reserve bulb	yes	

Dimensions	**D 650plus**
Diameter of light body	65 cm
Diameter of Polygon Reflectors	58,5 cm
Light emission surface (glass surface)	2370 cm^2
Max. swivel radius	237 cm
Lowest position of light body	128 cm
Highest position of light body	226 cm
Clearance (single light)	200 cm at 265 cm finished ceiling
Weight / Torque	
Weight with transformer	50 kg
Max. torque	342 Nm
Certificate	CE conform with 93/42 EEC UL listed

7.3 CHROMOPHARE® D 530plus

Light technical data	**D 530plus**	
Reflector system	Polygonreflector	
Colour temperature	4500plus K	3600 K
Intensity Ec at 1 m	110 [klx]	140 [klx]
Intensity control	55 – 110 [klx]	70 – 140 [klx]
Total radiant power at max intensity	410 W/m²	518 W/m²
Total radiant power/intensity Ec	3,7 [mW/m²lx]	
Colour rendering index R_a	94	
Light field diameter	15 – 25 cm	
d_{10} Light field dia. at 10% of max intensity	15 cm	
d_{50} Light field dia. at 50% of max intensity	8 cm	
Remaining illuminance when beam is obstructed by one mask	27 %	
Remaining illuminance when beam is obstructed by two mask	43 %	
Remaining illuminance inside at the bottom of a standardised tube.	100 %	
Remaining illuminance inside at the bottom of a standardised tube. Beam obstructed by one mask	27 %	
Remaining illuminance inside at the bottom of a standardised tube. Beam obstructed by two mask	43 %	
Depht of illumination L1 + L2	125 cm	
Electrical data		
Primary voltage of transformer	100 / 120 / 127 V A.C. 220 / 230 / 240 V A.C.	
Power consumption	240 VA or 170 VA at 24 V D.C.	
Rated capacity of transformer / frequency	240 VA 50/60 Hz	
Safety Category	1	
Protection provided by enclosure	IP 53	
General data		
Halogen bulb at colour temperature 4500plus K Order no.	22,8 V / 150 W CZ 908-22	
Life time of halogen bulb	1000 h	
Automatic switch over to reserve bulb	yes	

Dimensions	**D 530plus**
Diameter of light body	52 cm
Diameter of Polygon Reflectors	45,5 cm
Light emission surface (glass surface)	1374 cm^2
Max. swivel radius	231 cm
Lowest position of light body	130 cm
Highest position of light body	219 cm
Clearance (single light)	200 cm at 245 cm finished ceiling
Weight / Torque	
Weight with. transformer	35 kg
Max. torque	269 Nm
Certificate	CE conform with 93/42 EEC UL listed

7.4 CHROMOPHARE® D 300

	D 300 single arm	D 300 double arm
Reflector system	Polygonreflector	
Colour temperature	4500 K	
Intensity Ec at 1 m	50 [klx]	
Intensity control [klx]	no	
Total radiant power at max intensity	200W/m²	
Total radiant power/intensity Ec	4 [mW/m²lx]	
Colour rendering index R_a	88	
Light field diameter	14 cm	
Electrical data		
Prim. A.C. voltage of transformer	100 V ; 120 V ; 127 V 220 V ; 230 V ; 240 V	
Power consumption	60 VA	
Transformer – rated capacity	60 VA / 50/60 Hz	
Safety Category	1	
Protection provided by enclosure	IP 53	
General data		
Halogen bulb Order no.	12 V / 50 W CZ 955-12	
Life time of halogen bulb	1000 h	
Dimensions		
Diameter of light body	29 cm	
Diameter of Polygon Reflectors	24 cm	
Light emission surface (glass surface)	450 cm²	
Max. swivel radius	110 cm	190 cm
Lowest position of light body	120 cm	120 cm
Highest position of light body	214 cm	214 cm
Clearance (single light)	200 cm at 230 cm finished ceiling	200 cm at 240 cm finished ceiling
Weight incl. transformer	10 kg	12 kg
Max. torque	23 Nm	60 Nm
Certificate	CE conform with 93/42 EEC UL listed	

7.5 CHROMOPHARE® D 300 version 24 V A.C. and 24 V D.C.

	D 300 single arm	D 300 double arm
Reflector system	Polygonreflector	
Colour temperature	4500 K	
Intensity Ec at 1 m	30 [klx]	
Intensity control [klx]	no	
Total radiant power at max intensity	120W/m²	
Total radiant power/intensity Ec	4 [mW/m²lx]	
Colour rendering index R_a	88	
Light field diameter	14 cm	
Electrical data		
Voltage of the terminals	24 V A.C. und 24 V D.C.	
Power consumption	60 VA	
Safety Category	1	
Protection provided by enclosure	IP 53	
General data		
Halogen bulb Order no.	22,8 V / 55 W CZ 924-24	
Life time of halogen bulb	1000 h	
Dimensions		
Diameter of light body	29 cm	
Diameter of Polygon Reflectors	24 cm	
Light emission surface (glass surface)	450 cm²	
Max. swivel radius	110 cm	190 cm
Lowest position of light body	120 cm	120 cm
Highest position of light body	214 cm	214 cm
Clearance (single light)	200 cm at 230 cm finished ceiling	200 cm at 240 cm finished ceiling
Weight incl. transformer	10 kg	12 kg
Max. torque	23 Nm	60 Nm
Certificate	CE conform with 93/42 EEC UL listed	

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